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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/714,464

11/14/2003

Yoshio Kusano

IIW-035

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EXAMINER

RUTHKOSKY, MARK

ART UNIT

PAPER NUMBER

1745

MAIL DATE

DELIVERY MODE

05/10/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|-----------------|---------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/714,464 | KUSANO ET AL. | |
| | Examiner | Art Unit | |
| | Mark Ruthkosky | 1745 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 January 2007.
 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
 4a) Of the above claim(s) 6-20 is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 1-5 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/14/2003; 1/25/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

The information disclosure statements filed 11/14/2003 and 1/25/2007 have been placed in the application, and the information referred to therein has been considered as to the merits.

Drawings

The drawings filed on 11/14/2003 have been approved.

Election/Restrictions

Applicant's election with traverse of Group I, Species I, claims 1-5 in the reply filed on 1/22/2007 is acknowledged. The traversal is on the ground(s) that the inventions are not independent and a single search of the prior art would suffice. This is not found persuasive because the three inventions are independent as the inventions are to a humidifier coupled with a fuel cell, a method including method steps not found in the humidifier coupled with a fuel cell and a warming device that is used to warm a fuel cell. Searching for each invention would require a separate search including searching humidifier art, the heating art and processes found

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in the arts. Further, each invention will require examination of the claims and not simply a search. Consideration of each invention is required.

The requirement is still deemed proper and is therefore made FINAL.

Claim Interpretation

The instant claims are to a humidifier for humidifying a fuel cell composed of an anode side humidifier and a cathode side humidifier each possessing a plurality of hollow fiber membrane modules for migrating moisture between a supply gas, which is supplied to a fuel cell, and an exhaust gas, which is exhausted from the fuel cell to thereby humidify the supply gas, said humidifier comprising:

a pair of heads, which hold both ends of said hollow fiber membrane modules,
a connecting member which connects each of the heads, and
a device for warming the supply gas composed of conduits through which a cooling medium exhausted from the fuel cell is passed, wherein said device for warming the supply gas is configured to first warm a humidifier at an outlet side of the supply gas, and subsequently warm a humidifier at an inlet side of the supply gas.

As the body of the claim depends on the preamble for completeness, the preamble has been given patentable weight. A preamble is generally accorded patentable weight when the body of the claim depends on the preamble for completeness. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). The body of the claim includes a device for warming *the supply gas* composed of conduits through which *a cooling medium exhausted from the fuel cell* is passed, wherein said

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device for warming *the supply gas* is configured to first warm a humidifier at an outlet side of *the supply gas*, and subsequently warm a humidifier at an inlet side of *the supply gas*. Thus, the preamble provides structure to the invention, which is configured to function with required structure defined by the claims.

Claim Objections

Claims 1-5 are objected to because of the following informalities: The instant claims claim a humidifier, however, the claims require a combination of elements including fuel cell components such as a supply gas and a cooling medium and a warming device. Thus, the claimed invention is to a device that includes a fuel cell, a humidifier and a warming device. The invention is not a humidifier as known in the art. Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Katagiri et al. (US 2001/0015501.)

If the preamble of the claim is not given patentable weight, then the claims are anticipated by Katagiri et al. (US 2001/0015501.) The structure of the fuel cell, the reactants, the flow of reactants and the position of the humidifier do not further limit the claim, which is to a humidifier. Katagiri et al. (US 2001/0015501) teaches a humidifier for humidifying a fuel cell composed of a cathode side humidifier possessing a plurality of hollow fiber membrane modules for migrating moisture between a supply gas, which is supplied to a fuel cell, and an exhaust gas, which is exhausted from the fuel cell to thereby humidify the supply gas, said humidifier comprising a pair of heads which hold both ends of said hollow fiber membrane modules (p. 4-8), a connecting member which connects each of the heads (figure 1.) The humidifier includes a device for warming the supply gas composed of conduits through which a cooling medium exhausted from the fuel cell is passed, wherein said device for warming the supply gas is configured to first warm a humidifier at an outlet side of the supply gas, and subsequently warm a humidifier at an inlet side of the supply gas (see figures 12-13 and p. 107-111.) The heated fuel cell coolant flows with the exhaust gas into the humidifier and heats the humidifier first at an outlet side of the supply gas, and subsequently at an inlet side of the supply gas. Thus, the claims are anticipated.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katagiri et al. (US 2001/0015501) in view of Shimanuki et al. (US 2002/0041985.)

Katagiri et al. (US 2001/0015501) teaches a humidifier for humidifying a fuel cell composed of a cathode side humidifier possessing a plurality of hollow fiber membrane modules for migrating moisture between a supply gas, which is supplied to a fuel cell, and an exhaust gas, which is exhausted from the fuel cell to thereby humidify the supply gas, said humidifier comprising a pair of heads which hold both ends of said hollow fiber membrane modules (p. 4-8), a connecting member which connects each of the heads (figure 1.) The humidifier includes a device for warming the supply gas composed of conduits through which a cooling medium exhausted from the fuel cell is passed, wherein said device for warming the supply gas is configured to first warm a humidifier at an outlet side of the supply gas, and subsequently warm a humidifier at an inlet side of the supply gas (see figures 12-13 and p. 107-111.) The heated fuel cell coolant flows with the exhaust gas into the humidifier and heats the humidifier first at an outlet side of the supply gas, and subsequently at an inlet side of the supply gas. The conduit of the warming device follows said heads (see figures 1 and 11-13.)

Shimanuki et al. (US 2002/0041985) teaches a fuel cell including an anode side humidifier that employs an exhaust gas as the humidifying source for the fuel (claims 1-6.) The fuel cell may include a first and second humidifier to humidify the oxidant and fuel reactants. Claims 5-6 teach that the humidifying exhaust gas source may be used to humidify the oxidant and fuel reactants by flowing exhaust to each humidifier in either sequence. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include an anode side humidifier employing an exhaust gas as a fuel humidifying source in the fuel cell of Katagiri et al. (US 2001/0015501) in order to maintain the electrolyte membrane water content at a desired level for ionic conductivity and provide a fuel cell with a high generating efficiency (see col. 1 of Shimanuki et al. (US 2002/0041985).) The artesian would have found the claimed invention to be obvious in light of the teachings of the references.

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-6:30.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

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applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free.)

Mark Ruthkosky

Primary Patent Examiner

Art Unit 1745

Mark Ruthkosky
5.9.07